



Abstract

Abstract # 87

Rationale: FOIT treatment desensitizes most food allergic individuals, but the achievement of immunologic tolerance is uncertain. We report on 21 selected patients who underwent food challenges (FC) after FOIT was withheld for at least 30 days.

Methods: Retrospective record review of FOIT patients approved by the North Texas IRB. After 453-1752 days of maintenance dosing selected patients stopped ingesting the allergenic food for 1 month and then were subjected to an open, graded FC.

Results: 19/21 patients passed the FC (FCP) (5/5 egg, 6/7 milk, 7/8 peanut, 1/1 cashew). 15/19 FCP and 0/2 who failed the FC (FCF) had a history of anaphylaxis to the allergenic food prior to starting FOIT. Median IgE (kU/L) before beginning FOIT for FCP were egg 5.04 (0.37-49.97), milk 5.23 (1.52-10.93), peanut 10.39 (2.44-61.33), cashew 4.53; and for FCF: milk 54.24, peanut >100. Median IgE values before FC for FCP were egg 0.35 (0.1-15.9), milk 0.17 (0.08-0.3), peanut 0.96 (0.08-7.38), and cashew 1.14; and milk 1.16, peanut 11.5 for FCF. There were 0.26 epinephrine treated reactions per patient (ETRpp) during FOIT escalation and 0.05 ETRpp during maintenance for FCP. There were 2 ETRs in escalation and none in maintenance for the 2 FCF patients.

Conclusions: 90% of selected FOIT patients achieved tolerance to their allergenic food. These data suggest that patients with high pre-OIT IgE values, high pre-FC values, and more ETRs during escalation are less likely to pass FC. More FOIT patients will need to undergo FC before meaningful conclusions may be drawn concerning tolerance.

Introduction

Food allergy is a major problem for school aged children impairing quality of life, inhibiting socialization and increasing bullying¹⁻⁵. The avoidance management strategy does not address these issues and may exacerbate the problems.

We have reported that most food allergic patients can be safely desensitized to their allergenic food⁶, but achieving tolerance is uncertain. Herein, we define desensitization as the ability to consume, *ad lib*, an allergenic food while taking a daily maintenance dose of that food. Tolerance is defined as the ability to safely eat a previously allergenic food *ad lib* without the necessity of daily maintenance dosing. We report on 21 patients who completed FOIT escalation followed by a period of maintenance dosing and later underwent a tolerance FC.

Subjects*

21 patients underwent a tolerance FC following treatment with FOIT. Most subjects were chosen based on the following criteria:

1. Successful completion of FOIT escalation followed by ≥ 3 years of FOIT maintenance dosing.
2. No reactions during maintenance dosing for >2 years.
3. Pre-FC IgE <1 kU/L or >90% reduction in food specific IgE concentration.
4. Patients were evaluated at least yearly in our private allergy/immunology practice.

-Patients P014 and P052 did not meet criteria #1. P014 stopping taking his peanut dose after approximately 304 days of maintenance dosing. He did not take a peanut dose for approximately 180 days and then passed a peanut tolerance FC. P052 stopped taking his peanut dose after approximately 368 days of maintenance dosing. He had two peanut exposures without reaction during the subsequent 60 days and then had no peanut exposure for 90 days before passing a peanut FC. P014 and P0512 spent 355 and 104 days on escalation dosing, respectively.

-Patients E10, P012, and P045 do not meet criteria #3. Tolerance FC was performed at the parent's request.

*The data reported here were obtained from a retrospective record review approved by the North Texas IRB. Each parent signed consent to use their child's data.

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Methods*

Patients with a history of an IgE mediated food reaction were desensitized according to a previously reported protocol⁷. After completing FOIT escalation patients were instructed to ingest **a daily maintenance dose of either 1 tablespoon of egg white powder (1 egg equivalent), 240 ml of whole or 2% milk, 8 peanuts, or 8 cashew nuts.** They were allowed to freely incorporate the food into their diet during maintenance dosing. Patients were asked to report all reactions that occurred during both the escalation and maintenance phases.

Food-specific IgE was measured before FOIT, at the start of maintenance dosing, and then yearly.

Because this is a retrospective review of clinical care, commercial laboratories were used to measure allergen specific IgE. The choice of laboratory was often dictated by insurance companies. Therefore, some allergen specific IgE values were determined by the HYCOR[®] methodology and some by the IMMUNOCAP[®] methodology. In some instances, different methodologies were used for the same patient.

Tolerance FC Procedure

Patients were instructed to completely avoid the allergenic food for 1 month before tolerance FC. All challenges were performed under careful observation in an allergy practice office setting.

FC Dosing Schedules

	EGG (egg white powder)	MILK (whole milk)	PEANUT	CASHEW
Dose 1	25mg	0.3ml	25mg peanut flour	1 nut to suck for 1 minute
Dose 2	125mg	3.0ml	250mg peanut flour	30mg cashew flour
Dose 3	¼ tsp	30ml	4 peanuts	320mg cashew flour
Dose 4	3 tsp	240ml	24 peanuts	2.5 nuts
Dose 5	---	---	---	22 nuts

Doses were administered every 20 minutes. The last dose was followed by a 90 minute observation period. Patients who passed the challenge were encouraged to continue to eat the now tolerated food 2-3 times weekly, but daily maintenance dosing was discontinued. Those who failed the FC underwent a modified dose escalation schedule and then resumed maintenance dosing.

Only 44/102 FOIT patients who had completed 3 years of maintenance dosing met all three criteria for FC. Five patients underwent a tolerance FC because of non-adherence (P014, P052) or parental request (E10, P012, P045). Many FOIT maintenance patients refused a tolerance FC because they did not want to avoid the allergenic food for 1 month before the challenge. They preferred daily maintenance dosing to stopping the food for one month.

Results

•19/21 FOIT patients passed tolerance challenges.

•Patients E10, P014, P012, P045, and P052 did not meet standard criteria for tolerance FC, with only patient P045 failing the FC.

•**15/16 patients that met criteria passed the tolerance FC.** Patient M03 was the only patient that met criteria but failed the FC.

•**Egg:** All patients passed the tolerance FC, including patient E10 who did not meet criteria for FC and had high Pre-OIT and Pre-FC IgE values.

•**Milk:** Patient M03 had the highest Pre-OIT and Pre-FC IgE value. Even with a 98% drop in IgE value this patient failed the FC.

•**Peanut:** Patient P045 had the highest Pre OIT, Post #1, and Pre FC IgE values and was the only Peanut OIT patient to fail the tolerance FC.

Patient demographics, history and specific IgE

Patient identifier (E=egg M=milk P=peanut C=cashew)	Age at start of OIT	Age at Tolerance Challenge	# Days between reaching target dose and FC	# Reactions during Maint.	# ETRs during Maint.	H/o anaphylaxis before OIT	Pre OIT IgE (WE=whole egg EW=egg white)	Post OIT IgE #1	% drop from base-line	# days after reaching target	Pre FC IgE (EW)	% drop from base-line	# days after reaching target
E03	9	13	1470	0	0	Y	0.37 (WE)	0.22 (WE)	41	0	<0.35*	?	906
E04	5	10	1289	1	1	Y	5.04 (WE)	2.71 (WE)	46	0	0.42*	92	1197
E10 ^Ø	5	10	1752	0	0	Y	48.97 (WE)	6.82 (WE)	86	0	15.9*	68	1724
E12	8	12	1115	0	0	Y	5.24 (WE)	0.4* (WE)	92	0	0.1*	98	833
E24	10	13	943	0	0	Y	0.89 (EW)	0.19 (EW)	79	13	0.2	78	802
Medians	8	12	1289	0	0	-	5.04	0.4	79	0	0.35	85	906
M01	6	10	1297	0	0	Y	4.14	0.63	85	72	0.11	97	1289
M09	5	9	1230	3	2	Y	1.52	2.01	-32	6	0.08	95	945
M10	6	9	1038	0	0	N	6.23	6.96*	-12	1	0.23	96	995
M22	5	7	846	0	0	Y	4.23	0.47	89	322	0.08	98	782
M29	5	8	877	1	0	N	10.93	1.17	89	28	0.11	99	728
M34	8	10	453	0	0	Y	6.89	0.68	90	28	0.08	99	326
Medians	5.5	9	957	0	0	-	5.23	0.93	87	28	0.17	97.5	863
M03	9	13	1252	1	0	N	54.24	10.26	81	3	1.16	98	1212
P007	5	9	1106	0	0	Y	2.44	0.61	75	2	0.08	97	1065
P008	6	9	1089	0	0	N	10.95	10.42	5	8	1.36	88	923
P012 ^Ø	11	16	1608	0	0	Y	61.33	12.08	80	7	7.38	88	1392
P014 ^Ø	14	16	490	0	0	Y	24.81	2.1	92	356	1.66	93	491
P050	5	9	1337	0	0	Y	3.34	1.85	45	44	0.6	82	779
P052 ^Ø	10	12	538	0	0	Y	3.45	2.55*	26	33	0.96*	72	530
P055	11	14	1181	0	0	Y	10.39	4.44	57	33	0.6	94	1125
Medians	10	12	1106	0	0	-	10.39	2.55	57	33	1.81	88	923
P045 ^Ø	7	11	1392	0	0	N	100	23.7	76	28	11.5*	89	1319
C01	9	13	1030	1	0	N	4.53	3.69	19	28	1.14*	75	977

Patients in red failed tolerance challenge.

**Denotes change in laboratory methodology from baseline IgE methodology.*

Ø Patients that did not fit standard criteria for tolerance FC.

Conclusions/Discussion

•90% of tested FOIT patients and 94% of patients who met our pre-defined criteria for tolerance FC achieved tolerance to their allergenic food.

•Patients with high pre-OIT IgE values and high pre-FC values appear to be less likely to pass FC.

•It is possible that some milk and egg OIT patients may have outgrown their food allergy without OIT, but OIT allowed these patients to freely eat the allergenic food during OIT maintenance dosing. We have previously reported that FOIT markedly improves quality of life⁸.

• More FOIT patients will need to undergo FC before meaningful conclusions may be drawn concerning the predictors and likelihood of achieving tolerance.

• FOIT, administered in an allergy office, can induce tolerance in a highly selected population of food allergic patients.

References

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